

throttled to let gasses leak only a little and the vessel is kept pressurized. Another processing condition adopted including the second reaction step were the same with example 1. We obtained a very pure crystalline t-BN powder. SEM photograph of the obtained powder is shown in FIG. 6. The shapes of primary particles of the crystalline t-BN powder are nearly spherical, and the average primary particle size is about 0.25 μm , and majority particle sizes of the powder are in a range from 0.15 to 0.38 μm (or approximately from 0.1 to 0.4 μm). The ratio of anhydrous boric acid and urea is preferably from 4:6 to 4:9, and a ratio of about 4:9 gave the best result.

Example 7

A crystalline t-BN powder was synthesized utilizing the same processing conditions with example 6, and the X-ray powder diffraction diagram of the powder is shown in FIG. 7. Comparing X-ray powder diffraction diagrams of FIG. 7 and FIG. 1, it is recognized that the crystalline t-BN powder of FIG. 7 is crystallized to a greater extent than that of FIG. 1 and has sharp diffraction peaks at 26.7° and 41.8° in 2 θ which sites correspond to the [002] and the [100] diffraction peaks of h-BN, respectively. However, the angle of the peak which corresponds to [002] diffraction peak of h-BN is a slightly shifted to the large angle side, and there is no diffraction peak at the site which corresponds to the [102] diffraction peak (at 50°) of h-BN. There is a sharp but medium height diffraction peak at 41.8° which corresponds to the site of [100] diffraction of h-BN. This diffraction peak has a shoulder and a rather long foot on the larger angle side (hereinafter referred to "[10] diffraction peak") where the [101] diffraction peak of h-BN appears. Namely, the [101] diffraction peak for t-BN is not present as clear one. This feature means that the crystalline t-BN powder is pure well crystallized crystalline t-BN of monophase and is an example of crystalline t-BN powder (with very fine primary particle super-submicron sizes in the order of 0.2 to 0.3 μm)

of the present invention. The low background of the diffraction diagram indicates that the boron nitride powder is pure and well crystallized monophase crystalline t-BN. That is to say, in the diffraction diagrams of FIG. 2 and FIG. 7, there is no diffraction peaks attributed to that of B_2O_3 .

It should be noted that modification obvious in the art may be done without departing the gist and scope of the present invention as disclosed herein and claimed herein below as appended.

What is claimed is:

1. A method for producing a crystalline turbostratic boron nitride, comprising:
 - providing a mixture of a substantially amorphous boron nitride and an alkali-borate fluxing agent, and
 - crystallizing said amorphous boron nitride to said crystalline turbostratic boron nitride in the presence of an effective amount of said alkali-borate fluxing agent in a non-oxidizing atmosphere comprising an atmosphere within a vessel of a closed or quasi-closed state.
2. The method of claim 1, wherein said crystallizing is carried out by heating said mixture at a temperature of about 1500° C. or below for a time period until said amorphous boron nitride is substantially crystallized to said crystalline turbostratic boron nitride.
3. The method of claim 1, wherein said crystallizing is carried out at a temperature from 1200° C. to 1400° C.
4. The method of claim 1, wherein said alkali-borate comprises sodium borate and/or hydrate thereof.
5. The method of claim 1, wherein said alkali-borate in said mixture ranges from 0.01% to 20% by weight.
6. The method of claim 1, further comprising:
 - purifying the crystalline turbostratic boron nitride by washing with an aqueous cleaning liquid to remove impurities after forming the crystalline turbostratic boron nitride.

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